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# HARD RED SPRING WHEAT



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## QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

1977 & 1978 CROPS

UNITED STATES DEPARTMENT OF AGRICULTURE  
SCIENCE AND EDUCATION ADMINISTRATION, AGRICULTURAL RESEARCH  
NORTH CENTRAL REGION



UNITED STATES DEPARTMENT OF AGRICULTURE  
SCIENCE AND EDUCATION ADMINISTRATION, AGRICULTURAL RESEARCH  
in cooperation with  
STATE AGRICULTURAL EXPERIMENT STATIONS

REPORT OF PHYSICAL, CHEMICAL, MILLING, AND BAKING EXPERIMENTS  
WITH HARD RED SPRING WHEAT

1977 & 1978 CROPS<sup>1/</sup>

by

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1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled by the Science and Education Administration, Agricultural Research, U.S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations or quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.



## FOREWORD

This report is out of sequence. At the time when these data were obtained, the Wheat Quality Laboratory was scheduled for closing (Oct. 1977), so the operating budget was very low, and some of the staff had already left for other positions. Although the data included here were sent to the breeders who submitted samples, no formal reports were prepared at that time. To prevent a skip in the crop reports issued from this Laboratory, we have compiled the abbreviated 1977-78 report presented here. Because of lower priority, this was done after completion of the 1979 crop report.

V.L.Y.  
Spring & Durum Wheat Quality  
Laboratory

August 1980



## 1977 COOPERATING AGENCIES, STATIONS, AND PERSONNEL

The cooperating agencies and stations conducting the varietal plot and nursery experiments from which the 1977 spring wheat samples were received are listed below:

Idaho Agricultural Experiment Station:

Aberdeen

Minnesota Agricultural Experiment Station:

Crookston, Morris, and St. Paul

Montana Agricultural Experiment Station:

Bozeman, Havre, and Sidney

North Dakota Agricultural Experiment Station:

Dickinson, Fargo, Langdon, Minot, and Williston

South Dakota Agricultural Experiment Station:

Brookings and Selby

Wisconsin Agricultural Experiment Station:

Madison

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by Heiner, Elsayed, Quick, and Johnson, Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1977.



## 1978 COOPERATING AGENCIES, STATIONS, AND PERSONNEL

The cooperative agencies and stations conducting the varietal plot and nursery experiments from which the 1978 spring wheat samples were received are listed below:

California Agricultural Experiment Station:

El Centro

Idaho Agricultural Experiment Station:

Aberdeen

Minnesota Agricultural Experiment Station:

Crookston, Morris, and St. Paul

Montana Agricultural Experiment Station:

Sidney

North Dakota Agricultural Experiment Station:

Carrington, Dickinson, Fargo, Langdon, Minot,  
and Williston

South Dakota Agricultural Experiment Station:

Brookings, Redfield, and Selby

Washington Agricultural Experiment Station:

Pullman

Wisconsin Agricultural Experiment Station:

Madison

Wyoming Agricultural Experiment Station:

Sheridan and Torrington

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by Busch, Elsayed, and Quick. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1978.



## INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States<sup>2/</sup> have been milled each year by the USDA. The flours were assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators a continuation of the quality data through an abbreviated report for the 1977-1978 crops (See foreword statement). The same general format and techniques were used in evaluating the wheats as those discussed in the 1974-76 quality report.

The overall average baking evaluation for the 1977 crop Uniform Regional Nursery Blends was satisfactory to questionable and the 1978 crop was rated questionable to satisfactory.

The oxidation requirements for both crop years were the same, but with some variation between areas.

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<sup>2/</sup> Heiner, Busch, Elsayed, Quick, and Johnson. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1977-1978, Agricultural Research Service, U.S. Department of Agriculture and State Agricultural Experiment Stations, St. Paul, Minn.

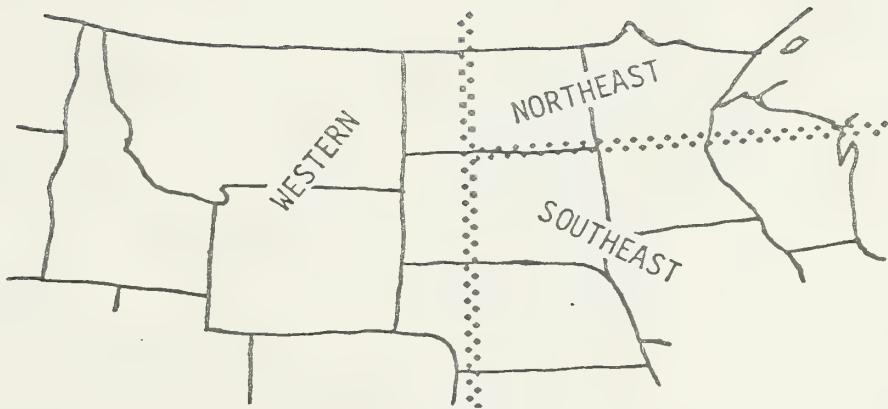


### SOURCE OF THE 1977 CROP SAMPLES

Tests were performed on 698 samples received from Field Plots, Uniform Regional Nurseries, and Sawfly Yield Nurseries of the 1977 crop. These samples originated in six states; Idaho, Minnesota, Montana, North Dakota, South Dakota, and Wisconsin. Fifteen stations from these states were represented, namely, Aberdeen in Idaho; Crookston, Morris, and St. Paul in Minnesota; Bozeman, Havre, and Sidney in Montana; Dickinson, Fargo, Langdon, Minot, and Williston in North Dakota; Brookings and Selby in South Dakota; and Madison in Wisconsin.

On page 8 are listed the spring wheats that were included in the 1977 Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number, and the C.I. number are given.

Individual wheat samples originating from the 3 spring wheat areas as outlined in the illustration were blended according to area. The samples were blended in equal portions and milled as area blends.



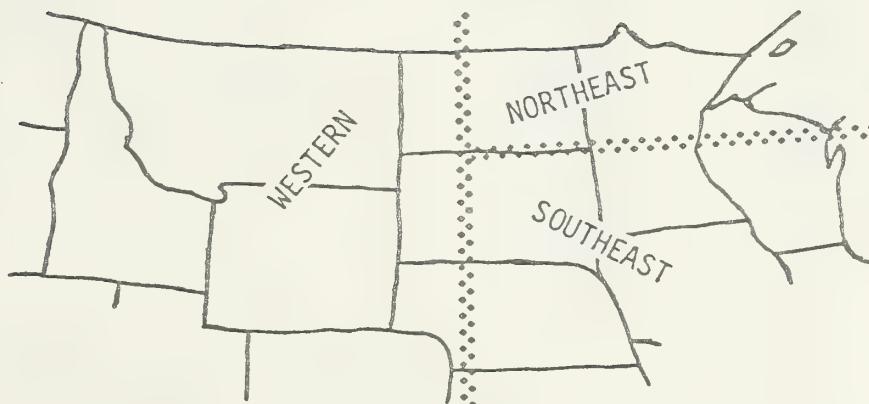


#### SOURCE OF THE 1978 CROP SAMPLES

Tests were performed on 700 samples received from Field Plots, Uniform Regional Nurseries, International Spring Wheat Nursery, and Sawfly Yield Nurseries of the 1978 crop. These samples originated in nine states: California, Idaho, Minnesota, Montana, North Dakota, South Dakota, Washington, Wisconsin, and Wyoming. Nineteen stations from these states were represented, namely El Centro in California; Aberdeen in Idaho; Crookston, Morris, and St. Paul in Minnesota; Sidney in Montana; Carrington, Dickinson, Fargo, Langdon, Minot, and Williston in North Dakota; Brookings, Redfield, and Selby in South Dakota; Madison in Wisconsin; Pullman in Washington; and Sheridan and Torrington in Wyoming.

On page 9 are listed the spring wheats that were included in the 1978 Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number, and the C.I. number are given.

The spring wheat area was divided into 3 areas as outlined in the illustration. The wheat samples from those stations falling within the arbitrary boundaries shown are blended in equal portions and milled on the Buhler mill as area blends.





ENTRIES INCLUDED IN THE 1977 UNIFROM REGIONAL  
HARD RED SPRING WHEAT NURSERY

Entry No.	Cross or Variety	C.I. or Sel. No.	Year Entered	Source
1	MARQUIS	3651	1929	Canada
2	CHRIS	13751	1960	USDA-MN
3	WALDRON	13958	1964	ND
4	COTEAU	17749	1976	ND
5	OLAF/ND496	ND547	1977	ND
6	OLAF/ND496	ND549	1977	ND
7	ND507/ND496	ND550	1977	ND
8	ND507/ND496-84	ND551	1977	ND
9	ND496's/4/ND396/3/JTN/AGENT/SUWON92	ND553	1977	ND
10	WALDRON//BAGE/CHRIS	ND554	1977	ND
11	OLAF/ND510-2	SD2273	1976	SD
12	EUREKA	SD2185	1977	SD
13	OLAF/NEEPAWA	SD2355	1977	SD
14	WALDRON//TZPP/AA	SD2358	1977	SD
15	ND499/3/JTN/RL4205/WI261	ND543**	1976	ND
16	OLAF/4/JTN/ND335//JTN/WANKEN/3/ CHRIS/WI261	ND555**	1977	ND
17	RR68/4/SI/3/NRN10/BVR14/5*CNT	MT749**	1976	USDA-MT
18	RR68/3/NRN10/BVR14//6*CNT	MT7416**	1976	USDA-MT
19	ANGUS	17744**	1972	USDA-MN
20	ERA/KITT	MN7086**	1975	USDA-MN
21	WALDRON/ERA	MN70170**	1976	USDA-MN
22	ERA/CHRIS MUTANT	MN70202**	1976	USDA-MN
23	FCH/C.I.13990	MN7125**	1976	USDA-MN
24	ERA's'/TOB66//FCH/CNO/3/POLK	MN7155**	1976	USDA-MN
25	WS1809//II-60-105/IRN646'68'	MN70181**	1977	USDA-MN
26	FCH/NOR//WEB/II-62-16/3/ERA	MN70197**	1977	USDA-MN
27	ERA*2/CHRIS MUTANT	MN7222**	1977	USDA-MN
28	BORAH/3/II-60-101//TZPP/SON64	ID0153**	1977	USDA-MN
29	ERA	13986**	1972	USDA-MN
30		75S5511**	1977	Northrup King
31		75S5513**	1977	Northrup King
32		MP54B**	1977	World Seeds

\*\*Semidwarf



ENTRIES INCLUDED IN THE 1978 UNIFORM REGIONAL  
HARD RED SPRING WHEAT NURSERY

Entry No.	Cross or Variety	C.I. or Sel. No.	Year Entered	Source
1	Marquis	3651	1929	Canada
2	Chris	13751	1960	USDA-MN
3	Waldron	13958	1964	ND
4	ND507/ND496	ND 550	1977	ND
5	ND 496 Sib/4/ND396/3/Pb/ Agent//Suwon 92	ND 557	1978	ND
6	Olaf/Butte	ND 560	1978	ND
7	Olaf//ND499/ND516	ND 561	1978	ND
8	ND507//Wisc. 271/Polk	ND 563	1978	ND
9	Olaf/ND510-2	SD 2273	1976	SD
10	Olaf/NEEPAWA	SD 2355	1977	SD
11	ND499/3/JTN/RL4205/WI261	ND 543**	1976	ND
12	RR68/4/SI/3/NRN10/BVR14/5*CNT	MT 749**	1976	USDA-MT
13	RR68/3/NRN10/BVR14//6*CNT	MT 7416**	1976	USDA-MT
14	Era	13986**	1972	USDA-MN
15	Waldron/Era	MN 70170**	1976	USDA-MN
16	FCH/C.I. 13990	MN 7125**	1976	USDA-MN
17	Era*2/Chris Mutant	MN 7222	1977	USDA-MN
18	WS1809//II-60-105/IRN646'68'	MN 70181**	1977	USDA-MN
19	Era/Chris Mutant	MN 70202**	1976	USDA-MN
20	Era/II-61-6//Waldron*2/Era	MN 7336**	1978	USDA-MN
21	Era/FBW406	MN 7378**	1978	USDA-MN
22		NHS183**-74	1978	North American Pl. Br.
23		NHS1001**-75	1978	North American Pl. Br.
24		75S5511**	1977	Northrup King
25		WSMP 122**	1978	World Seeds
26	K 69001696/Era	WA 6389** <sup>1</sup>	1978	WA

\*\*Semidwarf

<sup>1</sup>Previously K 7400033



## METHODS

The terminology and methods used were the same as those described in the 1974-76 Crop Hard Red Spring Wheat Quality Report.

## DISCUSSION

The basic techniques and criteria used in the milling and baking evaluation of the samples are the same as those discussed in the 1974-76 Quality Report.



### UNIFORM REGIONAL NURSERY SAMPLES - 1977 CROP

A total of 461 Uniform Regional Nursery samples were received. The samples represented 14 stations from 6 states. Wheat blends were made of the samples by area. Thirty-two samples were received from each of the 14 stations. Twenty-five selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were these named varieties: Angus, Chris, Coteau, Era, Eureka, Marquis, and Waldron. Wheat blends were milled and baked by the macro method. Chris and Waldron were used as the standards. The average evaluation for the northeastern area was some promise; southeastern area, little promise; and the western area, some promise. Uniform Nursery samples not included in the blends were milled and baked using the micro method. The 1977 standard Waldron blend was used as the milling and baking standard. Data are presented in Tables 1 through 4.

### FIELD PLOT NURSERY SAMPLES - 1977 CROP

Seventy samples were received from two states and three stations. The data for the individual samples are given in Tables 5 through 7. Samples were milled and baked using the macro method.

#### NORTH DAKOTA SAMPLES

Sixty-one samples were received from the Dickinson and Williston, North Dakota stations. Data are given in Tables 5 and 6. Chris and Waldron were used as standards.

#### WISCONSIN SAMPLES

Nine samples were received from the Madison, Wisconsin station. Data are given in Table 7. Butte was used as the standard.



INTERNATIONAL SAWFLY NURSERY AND  
SECONDARY SAWFLY NURSERY SAMPLES - 1977 CROP

One hundred sixty-eight samples were received from two stations in Montana, (Havre and Sidney), and three stations in North Dakota (Fargo, Minot, and Williston). Fortuna and Tioga were used as standards. Samples were milled and baked using the micro method. Data for the International Sawfly Nursery are given in Tables 8 through 12, and data for the Secondary Sawfly Nursery are given in Tables 13 through 15.



UNIFORM REGIONAL NURSERY AND  
WESTERN REGIONAL NURSERY SAMPLES - 1978 CROP

A total of 503 samples were received; 463 from the Uniform Regional Nursery and 40 from the Western Regional Spring Wheat Nursery. The samples represented 18 stations from 8 states. Wheat blends were made of the samples by area. Twenty-six samples were received from 16 stations. Twenty-two selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were these named varieties: Chris, Era, Marquis, and Waldron. Blends were milled and baked using the macro method. Chris and Waldron were used as standards. The average general evaluation for the northeastern area was some promise, southeastern area little promise, and western area little promise. Uniform Nursery samples from Pullman, Washington and Sheridan, Wyoming were not included in the blends and were milled and baked using the micro method. Chris and Waldron were used as standards. The Western Regional Nursery from Aberdeen, Idaho was also milled and baked using the micro method. The 1978 milling and baking standard and Borah were used as standards. Data are presented in Tables 16 through 20.

FIELD PLOT NURSERY SAMPLES - 1978 CROP

Eighty samples were received from two states and three stations. Samples were milled and baked using the macro method.

CALIFORNIA SAMPLES

Fifteen samples were received from El Centro, California station. The 1978 milling and baking standard was used as the standard. Data are given in Table 21.

NORTH DAKOTA SAMPLES

Sixty-five samples were received from the Dickinson and Williston, North Dakota stations. Chris and Waldron were used as standards. Data are given in Tables 22 and 23.



INTERNATIONAL NURSERY SAMPLES - 1978 CROP

Fourty-nine samples were received from the Fargo, North Dakota station. Samples were milled and baked using the micro method. Waldron was used for the standard. Data are given in Table 24.

INTERNATIONAL SAWFLY NURSERY AND  
SECONDARY SAWFLY NURSERY SAMPLES - 1978 CROP

One hundred eight samples were received from Sidney, Montana, and Fargo, Minot, and Williston, North Dakota. Fortuna and Thatcher were used for standards on the International samples and Fortuna was used for the Secondary samples from Williston. Samples were milled and baked using the micro procedure. Data for the International Sawfly Nursery are given in Tables 25 through 26 and data for the Secondary Sawfly Nursery from Williston are given in Table 27.







TABLE 2  
QUALITY DATA OF UNIFORM NURSERY SAMPLES

1972

CLEAN DRY - SUBTRACT 1 LB./BU. FOR DODGIE-FREE T. \*

14% INSURTE BASIS.  
1 = VERY SATISFACTORY. 2 = SATISFACTORY. 3 = QUESTIONABLE-SATISFACTORY. 4 = QUESTIONABLE-QUESTIONABLE. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.  
1 = NORMAL. 2 = NORMAL-SOFT. 3 = SOFT-NORMAL. 4 = SOFT. 5 = GEL. 6 = VERY SOFT.  
REFER TO REFERENCE MIXTURES FOR NUMERICAL CURVE PATTERN. (1 = VERY SOFT. 2 = ELASTIC. 3 = ELASTIC-PLIABLE. 4 = PLIABLE-ELASTIC. 5 = PLIABLE. 6 = BUCKY. 7 = BUCKY. 8 = BUCKY. 9 = BRIGHT WHITE. 10 = BRIGHT CREAMY. 11 = CREAMY. 12 = CREAMY. 13 = CREAMY. 14 = CREAMY. 15 = CREAMY. 16 = CREAMY. 17 = CREAMY. 18 = CREAMY. 19 = CREAMY. 20 = SLIGHTLY DEAD. 21 = DEAD. 22 = DEAD. 23 = DEAD. 24 = DEAD. 25 = DEAD. 26 = DEAD. 27 = DEAD. 28 = DEAD. 29 = DEAD. 30 = DEAD. 31 = DEAD. 32 = DEAD. 33 = DEAD. 34 = DEAD. 35 = DEAD. 36 = DEAD. 37 = DEAD. 38 = DEAD. 39 = DEAD. 40 = DEAD. 41 = DEAD. 42 = DEAD. 43 = DEAD. 44 = DEAD. 45 = DEAD. 46 = DEAD. 47 = DEAD. 48 = DEAD. 49 = DEAD. 50 = DEAD. 51 = DEAD. 52 = DEAD. 53 = DEAD. 54 = DEAD. 55 = DEAD. 56 = DEAD. 57 = DEAD. 58 = DEAD. 59 = DEAD. 60 = DEAD. 61 = DEAD. 62 = DEAD. 63 = DEAD. 64 = DEAD. 65 = DEAD. 66 = DEAD. 67 = DEAD. 68 = DEAD. 69 = DEAD. 70 = DEAD. 71 = DEAD. 72 = DEAD. 73 = DEAD. 74 = DEAD. 75 = DEAD. 76 = DEAD. 77 = DEAD. 78 = DEAD. 79 = DEAD. 80 = DEAD. 81 = DEAD. 82 = DEAD. 83 = DEAD. 84 = DEAD. 85 = DEAD. 86 = DEAD. 87 = DEAD. 88 = DEAD. 89 = DEAD. 90 = DEAD. 91 = DEAD. 92 = DEAD. 93 = DEAD. 94 = DEAD. 95 = DEAD. 96 = DEAD. 97 = DEAD. 98 = DEAD. 99 = DEAD. 100 = DEAD.







TABLE 4	SPECIAL	UNIFORM	NURSERY	SAMPLES NOT INCLUDED	INCLUDED IN BLENDS
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1977 CROP







E 6  
CITY DATA OF FIELD PLOT NURSERY SAMPLES











977 CACP



























DE 16  
ABILITY DATA FOR UNIFORM REGIONAL NURSERY HLENS







TABLE 18  
WILLET, DATA FOR UNICORN DECISIONS











TABLE 21  
QUALITY DATA ON FIELD PLOT BURSEY SAMPLES

VARIETY	CH. SEL. NO.	T.W. Lb./G.	1900 KWT.	EGRNED Lb./G.	WHT. MIN. PRO. CHAR.	KERN. 2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 11/ 12/ 13/ 14/ 15/ 16/ 17/ 18/ 19/ 20/ 21/ 22/ 23/ 24/ 25/ 26/ 27/ 28/ 29/ 30/ 31/ 32/ 33/ 34/ 35/ 36/ 37/ 38/ 39/ 40/ 41/ 42/ 43/ 44/ 45/ 46/ 47/ 48/ 49/ 50/ 51/ 52/ 53/ 54/ 55/ 56/ 57/ 58/ 59/ 60/ 61/ 62/ 63/ 64/ 65/ 66/ 67/ 68/ 69/ 70/ 71/ 72/ 73/ 74/ 75/ 76/ 77/ 78/ 79/ 80/ 81/ 82/ 83/ 84/ 85/ 86/ 87/ 88/ 89/ 90/ 91/ 92/ 93/ 94/ 95/ 96/ 97/ 98/ 99/ 100/ 101/ 102/ 103/ 104/ 105/ 106/ 107/ 108/ 109/ 110/ 111/ 112/ 113/ 114/ 115/ 116/ 117/ 118/ 119/ 120/ 121/ 122/ 123/ 124/ 125/ 126/ 127/ 128/ 129/ 130/ 131/ 132/ 133/ 134/ 135/ 136/ 137/ 138/ 139/ 140/ 141/ 142/ 143/ 144/ 145/ 146/ 147/ 148/ 149/ 150/ 151/ 152/ 153/ 154/ 155/ 156/ 157/ 158/ 159/ 160/ 161/ 162/ 163/ 164/ 165/ 166/ 167/ 168/ 169/ 170/ 171/ 172/ 173/ 174/ 175/ 176/ 177/ 178/ 179/ 180/ 181/ 182/ 183/ 184/ 185/ 186/ 187/ 188/ 189/ 190/ 191/ 192/ 193/ 194/ 195/ 196/ 197/ 198/ 199/ 200/ 201/ 202/ 203/ 204/ 205/ 206/ 207/ 208/ 209/ 210/ 211/ 212/ 213/ 214/ 215/ 216/ 217/ 218/ 219/ 220/ 221/ 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1113/ 1114/ 1115/ 1116/ 1117/ 1118/ 1119/ 1119/ 1120/ 1121/ 1122/ 1123/ 1124/ 1125/ 1126/ 1127/ 1128/ 1129/ 1129/ 1130/ 1131/ 1132/ 1133/ 1134/ 1135/ 1136/ 1137/ 1138/ 1139/ 1139/ 1140/ 1141/ 1142/ 1143/ 1144/ 1145/ 1146/ 1147/ 1148/ 1149/ 1149/ 1150/ 1151/ 1152/ 1153/ 1154/ 1155/ 1156/ 1157/ 1158/ 1159/ 1159/ 1160/ 1161/ 1162/ 1163/ 1164/ 1165/ 1166/ 1167/ 1168/ 1169/ 1169/ 1170/ 1171/ 1172/ 1173/ 1174/ 1175/ 1176/ 1177/ 1178/ 1179/ 1179/ 1180/ 1181/ 1182/ 1183/ 1184/ 1185/ 1186/ 1187/ 1188/ 1189/ 1189/ 1190/ 1191/ 1192/ 1193/ 1194/ 1195/ 1196/ 1197/ 1198/ 1198/ 1199/ 1199/ 1200/ 1201/ 1202/ 1203/ 1204/ 1205/ 1206/ 1207/ 1208/ 1209/ 1209/ 1210/ 1211/ 1212/ 1213/ 1214/ 1215/ 1216/ 1217/ 1218/ 1219/ 1219/ 1220/ 1221/ 1222/ 1223/ 1224/ 1225/ 1226/ 1227/ 1228/ 1229/ 1229/ 1230/ 1231/ 1232/ 1233/ 1234/ 1235/ 1236/ 1237/ 1238/ 1239/ 1239/ 1240/ 1241/ 1242/ 1243/ 1244/ 1245/ 1246/ 1247/ 1248/ 1249/ 1249/ 1250/ 1251/ 1252/ 1253/ 1254/ 1255/ 1256/ 1257/ 1258/ 1259/ 1259/ 1260/ 1261/ 1262/ 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TABLE 22  
QUALITY DATA ON FIELD PLCY NURSERY SAMPLES

VARIETY OR SELL. NO.	F. NO.	LOC.	WT. Lb.	Wt. Lb.	KERN. %	FLK. %	MINTE. %	PH. %	ML. %	MIX. %	DOUGH. %	CRUMB. %	CRUMH. %	LOAF. %	BAK. %	GEN. %	VUL. %	VAL. %	MINUS. %	DEFICIENCY. %			
DICKINSON, NORTH DAKOTA																							
ANGUS	46-1	65	39	3	14.9	1.6-1	4	6.9-2	0-37	1.5-5	1	6.6-7	4	6.5-4	2.3-30	3	101.5	82.05	9.40	4	SW		
BLITZ	51-1	53.0	37	2	15.1	1.5-1	3	6.9-2	0-37	1.5-4	1	6.6-3	4	6.4-3	2.3-30	3	101.5	82.05	9.40	4	KW		
CHARIE	51-2	52.7	49	2	15.1	1.6-2	3	6.9-2	0-37	1.5-4	1	6.4-3	4	6.4-3	2.3-30	3	101.5	82.05	9.40	4	KW		
CHATEAU	51-3	54.5	49	2	14.6	1.4-1	2	6.9-2	0-37	1.5-0	1	6.2-3	4	6.3-3	2.3-30	3	101.5	82.05	9.40	4	WP		
ELKHORN	61-4	55	2	14.6	1.4-1	2	7.0-1	0-38	1.5-0	1	6.2-3	3	101.5	82.05	9.40	4	WP	0.5	3	WP			
ELKHORN	59-1	57.3	59	28	15.1	1.5-1	3	7.1-1	0-38	1.4-3	1	6.7-7	4	6.7-3	3.5-50	3	103.8	85.0	14.20	2	4	SK	
ELKHORN	62-1	49.5	50	1	15.1	1.5-1	3	7.1-1	0-38	1.4-5	1	6.7-7	4	6.7-3	3.5-50	3	103.8	85.0	14.20	2	4	SK	
ELKHORN	62-2	51.7	55	49	1	14.7	1.2-6	2	6.6-6	0-39	1.2-5	1	6.5-7	4	6.5-3	3.5-50	3	103.9	87.0	10.95	2	4	WP
ELKHORN	51-4	58.5	75	0	15.6	1.5-1	2	6.6-4	0-37	1.4-7	2	6.4-7	5	6.5-3	3.5-50	3	103.9	87.0	10.95	2	4	WP	
FRUIT	55-1	49.3	50	49	1	14.5	1.4-5	5	6.7-2	0-39	1.4-5	1	6.4-2	5	6.4-7	3.5-50	3	103.0	84.99	8.60	1	TP	SW
FRUIT	61-2	57.6	18	87	1	14.5	1.4-5	5	6.7-2	0-39	1.4-5	1	6.4-2	5	6.4-7	3.5-50	3	103.0	84.99	8.60	1	TP	SW
FRUIT	62-3	50.5	62	37	1	14.5	1.4-5	5	6.7-2	0-39	1.4-5	1	6.4-2	5	6.4-7	3.5-50	3	103.0	84.99	8.60	1	TP	SW
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	
FRUIT	52-7	57.6	29	0	15.4	1.5-1	2	7.2-4	0-34	1.4-5	1	6.5-7	4	6.5-3	3.5-50	3	103.0	84.99	8.60	1	TP	SW	



23  
DATA ON FIELD PLANT NURSERY SAMPLES

QUESTIONABLE = 6      UNSATISFACTORY = 7      QUESTIONABLE-UNSATISFACTORY = 8      UNSATISFACTORY = 9

1 = NO PROMISE, 2 = LITTLE PRECISE, 3 = SOME PRECISE, 4 = GOOD PROMISE.







25  
TY DATA OF INTERNATIONAL SAWFLY NURSERY SAMPLES

TY. CR. NO.	T.M. NO.	1000 KWT. /BU.	KERNEL LGE. %	NED SHE.	WHT. PRO. %	KEEN. CHAR. %	FLU. EXT. %	MIN. 65EX. %	MLG. PRO. %	MIK. ABS. %	BAKE. ABS. %	MIX. PEP. %	BAKE. PEP. %	LICHT. TIME HRS. %	CHUB. TIME HRS. %	GRAN. VOL. %	LICHT. BAKE VOL. %	GENL. EVAL. %	MINOR DEFICIENCY %	MAJOR DEFICIENCY	
STUN. NORTH DAKOTA																					
61.5	34.1	19	77	4	1.61	15.4	4	67.6	0.448	15.1	1	2	63.5	4	2.75	6	101.7	2	4	LG	SM
62.2	35.2	15	77	4	1.63	15.0	2	65.9	0.447	14.1	1	2	62.5	3	2.75	4	92.0	2	4	DC	DC
61.5	35.7	6	64	34	1.63	14.6	2	65.9	0.442	13.5	1	2	62.5	3	2.75	4	92.0	3	3	NT	M65
62.5	30.4	32	67	1	1.62	14.5	3	67.1	0.449	14.1	1	3	60.7	3	2.75	6	101.9	2	2	KW	M65
62.0	38.9	60	39	2	1.68	15.8	2	65.4	0.442	15.1	1	2	62.0	2	2.50	5	103.0	2	4	LG	DC
61.5	36.0	57	81	5	1.68	15.4	2	67.3	0.449	14.1	1	2	66.5	3	2.75	4	102.2	2	4	KW	M65
62.5	32.8	54	81	5	1.65	14.7	2	67.3	0.449	14.1	1	2	62.5	3	2.50	5	103.8	2	2	KW	M65
61.5	34.8	67	7	1.65	14.1	4	66.2	0.434	13.5	1	3	61.0	3	4.50	5	105.9	1	1	KW	MT	
59.8	26.7	6	67	1	1.68	13.2	6	62.3	0.534	12.5	2	2	61.7	3	3.50	5	102.5	2	1	TW	CC.
61.0	37.0	50	46	10	1.60	13.5	6	63.0	0.447	13.0	1	2	58.3	3	4.25	4	102.8	2	4	KW	DC
61.0	37.5	50	46	10	1.65	13.8	5	66.0	0.444	13.0	1	2	59.3	4	4.00	5	108.0	3	1	KW	DC
61.0	36.0	54	57	2	1.64	14.1	5	64.9	0.449	14.0	1	2	58.3	4	4.25	5	105.9	1	1	KW	BA
60.5	44.6	61	37	2	1.62	15.4	5	64.2	0.444	14.3	1	2	59.1	3	4.25	5	103.5	1	1	KW	BA
59.5	37.7	74	25	1	1.70	15.7	3	65.9	0.446	14.9	1	2	64.7	3	2.75	4	102.5	2	4	TW	DO
5-1	61.0	37.7	74	25	1.67	15.4	3	65.9	0.446	14.9	1	2	64.7	3	2.75	4	102.5	2	4	TW	DO
61.0	37.7	74	25	1	1.65	15.3	3	65.5	0.446	14.5	1	2	65.3	3	2.75	4	103.5	2	4	TW	DO
60.0	40.0	60	50	1	1.64	15.3	3	65.5	0.448	14.6	1	2	63.0	3	2.50	5	101.0	2	2	KW	DO
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2	0.446	13.7	1	4	59.3	3	4.00	6	102.0	2	2	KW	EX
61.0	40.0	60	50	1	1.64	15.3	4	65.2													



TABLE 26  
QUALITY DATA OF INTERNATIONAL SAMPLE EXP-71 SAMPLES

VARIETY OR SEL. NO.	T.M. #/BU.	L000 KWT.	KERNED LICED SEED	WHT. MIN.	KERN. CHAR.	FLR. EXT.	MIN. @ 55%	FLR. PRO.	MLG. PER.	MIX. ABS.	BAKE. ABS.	DOUGH TIME	CRUMB COLOR	CRUMB GRAN.	LOAD VOL. EVAL.	GEN. 3/7	MINOR DEFICIENCY	MAJOR DEFICIENCY	
MINOT, NORTH DAKOTA	46.1	48	50	2	1.67	1.61	2	6.62	0.57	15.9	1	6.74	4	3	1.66	2	1	KW	
CHRIS. LICED	64.2	62.9	62.0	1	1.68	1.55	2	6.60	0.58	14.7	1	6.35	5	3	1.66	2	1	KW	
THATCHER	61.0	63.2	65.3	1	1.74	1.57	3	6.61	0.51	15.0	1	6.35	5	3	1.66	2	1	KW	
TOGO	45.5	73	1.65	1	1.65	1.55	2	6.50	0.44	15.3	1	6.53	4	2.75	5	4	4	LG	
WALDON	62.2	40.5	75	24	1.70	1.62	2	6.34	0.45	14.9	1	6.35	3	2.75	5	4	4	PO	
748-27676	61.5	39.2	75	24	1.63	1.55	2	6.62	0.52	14.9	1	6.25	3	2.75	5	4	4	BA	
MT 766	61.0	40.7	75	24	1.63	1.55	2	6.62	0.52	14.9	1	6.25	3	2.75	5	4	4	BA	
MT 754	57.1	30.4	75	8	1.78	1.43	6	5.95	0.55	14.9	1	6.42	4	2.75	5	4	4	BA	
MT 7567	31.9	1.7	71	10	1.79	1.37	8	5.95	0.52	13.2	2	6.35	3	2.75	5	4	4	BA	
MT 7710	61.0	42.6	63	35	1.70	1.49	4	6.62	0.59	13.5	1	6.07	2	6.07	2	1	1	UP	
MT 7718	61.0	41.5	50	3	1.67	1.45	4	6.62	0.54	14.6	1	6.32	4	2.75	5	4	4	BA	
MT 7720	61.0	42.0	50	3	1.65	1.45	4	6.62	0.54	14.6	1	6.25	3	2.75	5	4	4	BA	
SU 8-1	62.0	46.5	83	16	1.69	1.53	2	6.55	0.56	14.6	1	6.42	3	2.75	6	5	5	DO	
SU 21	62.2	42.0	59	40	1.74	1.56	2	6.69	0.45	15.0	1	6.19	3	6.19	4	3	3	BA	
SU 21-1	56.4	32.6	56	32	1.69	1.56	2	6.55	0.45	14.5	1	6.23	3	6.23	4	3	3	BA	
SU 56-2	61.0	41.0	76	44	1.69	1.56	2	6.62	0.56	14.5	1	6.23	3	6.23	4	3	3	BA	
SU 57	62.3	39.7	66	33	1.77	1.55	2	6.61	0.51	15.2	1	6.19	3	6.19	3	3	3	BA	
SU 59-2	62.2	46.3	79	20	1	1.61	1.55	2	6.60	0.47	14.8	1	6.19	2	6.19	2	3	3	DO
FARGO, NORTH DAKOTA	58.1	27.8	85	11	1.60	2.02	2	6.10	0.54	15.1	1	2.61	3	2.75	4	4	4	DO	
CHRIS. LICED	58.1	30.5	71	23	1.60	2.02	2	6.10	0.54	15.1	1	2.61	3	2.75	4	4	4	DO	
THATCHER	57.9	26.8	70	20	1.65	2.04	2	6.10	0.54	15.1	1	2.61	3	2.75	4	4	4	DO	
TOGO	58.0	21.0	1.7	75	8	2.10	2	6.07	0.57	14.7	2	6.07	3	3.25	5	5	5	DO	
WALDON	58.2	36.0	44	55	1.71	2.07	15.5	2	5.55	0.57	14.7	3	6.13	3	3.75	4	4	EX	
MT 766	56.2	27.2	86	81	1.66	2.01	16.6	2	5.59	0.62	15.5	3	6.16	4	3.75	4	4	EX	
MT 754	53.8	28.3	85	86	1.69	2.00	15.5	2	5.54	0.61	15.5	3	6.16	4	3.75	4	4	EX	
MT 757	53.9	28.3	85	82	1.69	2.02	15.5	2	5.54	0.60	15.5	3	6.16	4	3.75	4	4	EX	
MT 7710	57.5	67	6	20.8	1.64	5.59	0.59	15.5	1	6.07	1	6.28	3	4.75	5	5	5	DO	
MT 7718	55.2	33.1	1.79	78	3	2.39	1.75	4	5.59	0.59	17.2	1	6.63	3	4.25	5	5	5	DO
MT 7720	56.6	33.1	70	23	1.70	2.04	15.4	2	5.59	0.56	17.2	1	6.28	3	5.87	5	5	5	DO
SU 8-1	56.0	38.0	71	26	1.77	2.05	17.6	2	5.59	0.56	17.2	2	6.32	3	6.07	5	5	5	DO
SU 21	59.9	36.5	12	63	5	2.01	16.4	2	5.81	0.52	15.6	1	6.03	3	6.03	4	4	EX	
SU 28-1	57.7	28.0	23	74	1.62	1.62	15.5	2	5.59	0.53	14.9	1	6.19	3	3.75	6	6	DO	
SU 56	59.0	29.0	23	72	5	2.09	15.5	2	5.56	0.53	14.9	1	5.97	5	3.75	6	6	DO	
SU 57	57.5	29.3	27	69	4	2.20	17.7	3	5.58	0.59	17.5	2	6.23	3	3.50	3	2	DO	
SU 99	56.3	33.7	39	57	4	2.11	17.2	3	5.51	0.59	16.7	2	6.13	2	2.50	5	5	DO	
1V	CLEAN DRY - SUBTRACT 1 Lb./BU. FOR DODGE-FREE T.H.																		
2V	14% MOISTURE BASIS, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																		
3V	1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT, 4 = SOFT, 5 = GUM, 6 = VERY SOFT, 7 = PLIABLE, 8 = PLIABLE, 9 = PLIABLE-ELASTIC, 10 = ELASTIC-PLIABLE, 11 = ELASTIC, 12 = VERY ELASTIC, 13 = PLIABLE, 14 = ELASTIC, 15 = ELASTIC-PLIABLE, 16 = PLIABLE, 17 = ELASTIC, 18 = ELASTIC-PLIABLE, 19 = ELASTIC, 20 = SLIGHTLY OPEN, 21 = OPEN, 22 = OPEN, 23 = OPEN, 24 = OPEN, 25 = OPEN, 26 = OPEN, 27 = OPEN, 28 = OPEN, 29 = OPEN, 30 = SLIGHTLY OPEN, 31 = OPEN, 32 = OPEN, 33 = OPEN, 34 = OPEN, 35 = OPEN, 36 = OPEN, 37 = OPEN, 38 = OPEN, 39 = OPEN, 40 = OPEN, 41 = OPEN, 42 = OPEN, 43 = OPEN, 44 = OPEN, 45 = OPEN, 46 = OPEN, 47 = OPEN, 48 = OPEN, 49 = OPEN, 50 = OPEN, 51 = OPEN, 52 = OPEN, 53 = OPEN, 54 = OPEN, 55 = OPEN, 56 = OPEN, 57 = OPEN, 58 = OPEN, 59 = OPEN, 60 = OPEN, 61 = OPEN, 62 = OPEN, 63 = OPEN, 64 = OPEN, 65 = OPEN, 66 = OPEN, 67 = OPEN, 68 = OPEN, 69 = OPEN, 70 = OPEN, 71 = OPEN, 72 = OPEN, 73 = OPEN, 74 = OPEN, 75 = OPEN, 76 = OPEN, 77 = OPEN, 78 = OPEN, 79 = OPEN, 80 = OPEN, 81 = OPEN, 82 = 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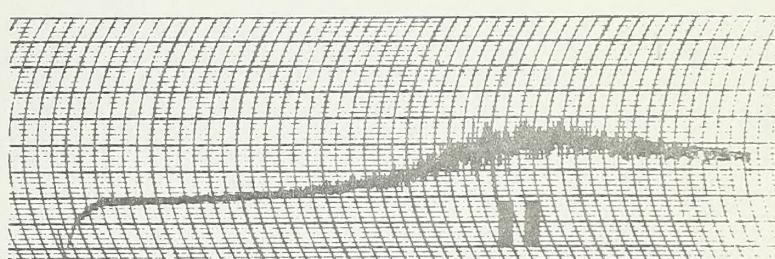
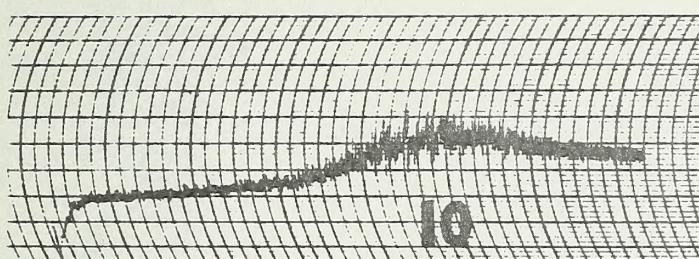
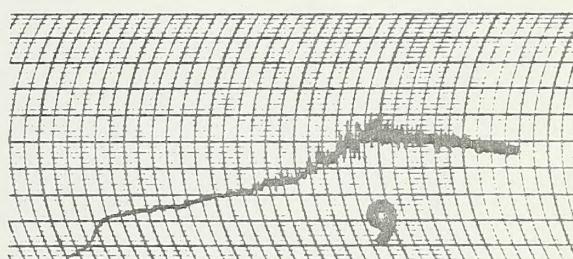
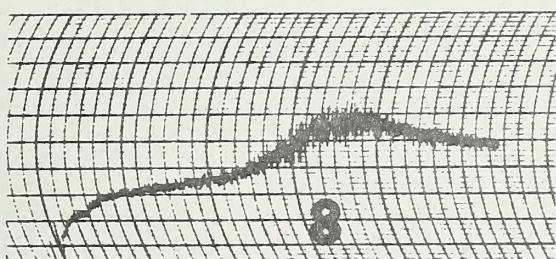
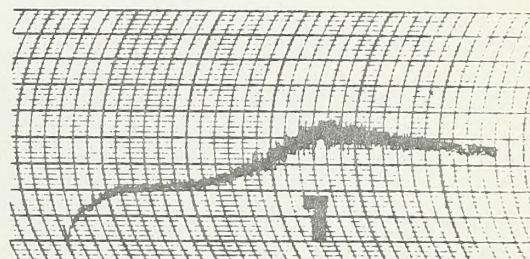
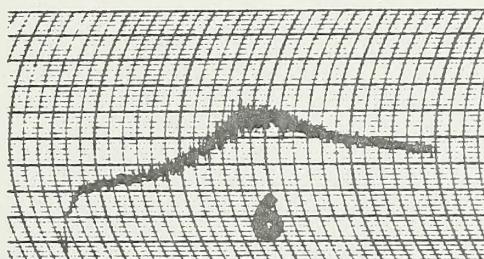
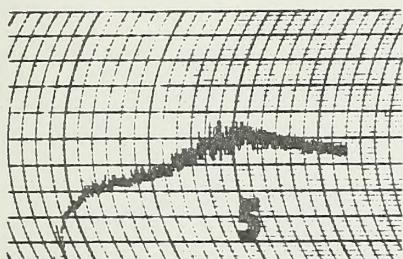
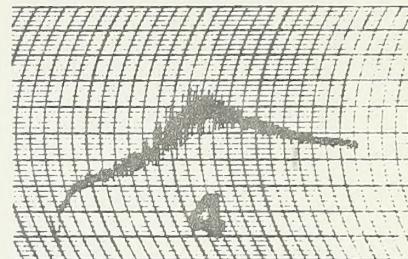
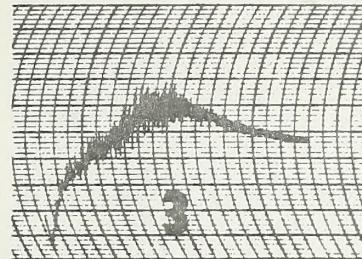
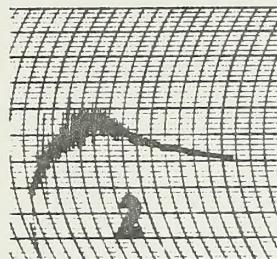
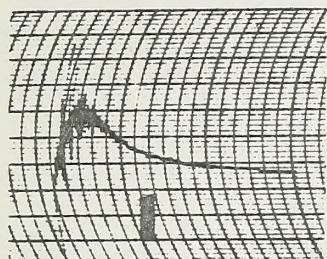
TABLE 27  
QUALITY DATA OF SECONDARY SANFELV NURSERY SAMPLES  
1976 CROP

VARIETY CR SCE. NO.	1000 KAT. #/U.	KENNEDY SIEV. #/U.	MIN. #/U.	MAX. #/U.	KERN. %	FLR. %	MIN. %	FLR. %	MIN. %	FLR. %	MIN. %	EAK. %	MAX. %	FLR. %	MIN. %	DUG. %	CRUMB. %	CRUMB. %	CRUMB. %	GEN. %	GEN. %	GEN. %	MAJOR DEFICIENCY			
WILLISTON NUGRIT DAKOTA	38.3	28	1.43	1.60	6.0	0.36	1.36	1	2	61.3	3	3.00	6	102.0	300.99	158	3	KW	LG	LG	LG	LG	LG	M65		
BUTTE	62.5	70	2	1.71	6.0	0.49	1.04	1	2	66.0	4	3.00	6	102.0	300.77	180	3	KW	LG	LG	LG	LG	LG	M65		
COTEAU	37.7	16	1.57	1.65	3	0.33	1.04	1	2	61.9	5	3.00	5	104.9	302.75	181	2	4	LG	LG	LG	LG	LG	LG	M65	
FLINTINA	46.5	57	5.0	1.54	2	0.33	1.04	1	2	61.9	5	3.00	5	104.9	302.75	181	2	4	LG	LG	LG	LG	LG	LG	M65	
GRAN	62.0	46.5	3.6	1.54	2	0.33	1.04	1	2	61.9	5	3.00	5	104.9	302.75	182	3	4	LG	LG	LG	LG	LG	LG	M65	
GRAN	62.0	41.2	4.2	1.57	1.54	2	0.37	1.04	1	2	61.9	5	3.00	5	104.9	302.75	182	3	4	LG	LG	LG	LG	LG	LG	M65
GRAN	62.0	41.2	4.2	1.57	1.54	2	0.37	1.04	1	2	61.9	5	3.00	5	104.9	302.75	182	3	4	LG	LG	LG	LG	LG	LG	M65
TRICIA	60.5	42.0	6.0	1.62	1.58	3	0.38	1.04	1	3	62.5	3	2.75	4	104.9	301.59	186	4	KW	LG	LG	LG	LG	LG	M65	
SOULDN	60.0	42.0	5.9	1.55	1.55	3	0.38	1.04	1	3	62.5	3	2.75	4	104.9	301.59	186	4	KW	LG	LG	LG	LG	LG	M65	
SOULDN	60.0	42.0	6.5	1.53	1.51	3	0.38	1.04	1	3	62.5	3	2.75	4	104.9	301.59	186	4	KW	LG	LG	LG	LG	LG	M65	
SUL-B	60.5	42.0	6.5	1.56	1.56	2	0.40	1.04	1	3	62.5	3	2.75	4	104.9	301.59	186	4	KW	LG	LG	LG	LG	LG	M65	
SUL-B	61.0	40.3	6.7	1.58	1.58	2	0.40	1.04	1	2	62.8	4	3.00	5	103.6	301.59	177	2	4	KW	LG	LG	LG	LG	LG	M65
SUL-B	61.0	40.3	6.7	1.58	1.58	2	0.40	1.04	1	2	62.8	4	3.00	5	103.6	301.59	177	2	4	KW	LG	LG	LG	LG	LG	M65
SUL-B	61.0	43.3	3.7	1.54	1.54	2	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	5.5	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX	EX	EX	EX	EX	EX	M65
SUL-B	61.0	42.7	3.7	1.54	1.53	3	0.40	1.04	1	3	63.2	5	3.00	5	104.9	301.59	177	2	3	EX						



# REFERENCE MIXOGRAMS

## HARD RED SPRING WHEAT



U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA





